

## CLAIMS

What is claimed is:

1. A method of screening for a gene affecting the cardiac function comprising the steps of:
  - a. providing an adult *Drosophila*;
  - b. imaging the heart of said *Drosophila*;
  - c. measuring the movements of the heart in the image; and
  - d. analyzing the measurements of the movements;
 whereby the analysis of said measurements are indicative of the cardiac function of said *Drosophila* and changes in the function are indicative of the effect of said gene on the cardiac function of said *Drosophila*.
2. The method of claim 1 further including the step of electrically pacing the heart with electrodes and a pulse generator, so that parameters selected from the group consisting of the maximal heart rate and the frequency of occurrence of fibrillation-like rhythm are determined.
3. The method of claim 1 further including the step of increasing the temperature to stress the heart.
4. The method of claim 1 wherein the effect of said gene on age-related changes in said cardiac function is determined.
5. The method of claim 1 wherein said *Drosophila* is a *Drosophila melanogaster*.
6. The method of claim 1, wherein said *Drosophila* is anesthetized.
7. The method of claim 6, wherein the anesthesia is caused by triethylamine.
8. The method of claim 1, wherein said *Drosophila* is positioned under a microscope so that the light beam of said microscope is generally perpendicular to the frontal plane of said *Drosophila* and is directed on the heart of said *Drosophila* and produces said image.
9. The method of claim 8, wherein contrast enhancement means are combined with said microscope to improve said image of said heart.
10. The method of claim 8 wherein said microscope is a fluorescence microscope and said *Drosophila* expresses a fluorescent protein in the heart.
11. The method of claim 10, wherein said fluorescent protein is green fluorescent protein.
12. The method of claim 1, wherein the movements of the walls of said heart are measured.

13. The method of claim 12 wherein said measure of the movements of said heart walls is heart rate.
14. The method of claim 1, wherein the measurements are compared to a control set of data.
15. The method of claim 1, wherein said genes is mutated.
- 5 16. The method of claim 15, wherein said mutation causes a change in expression of said gene.
17. The method of claim 16, wherein the change in expression of said gene causes age-related changes in said cardiac function.
18. The method of claim 15, wherein said mutation causes age-related changes in cardiac function.
- 10 19. A method of screening for agents affecting cardiac function comprising the steps of:
  - a. providing an adult *Drosophila*;
  - b. exposing said *Drosophila* to an agent;
  - c. imaging the heart of said *Drosophila*;
  - 15 d. measuring the movements of the heart in the image; and
  - e. analyzing the measurements of the movements;
 whereby the analysis of said measurements are indicative of the cardiac function of said *Drosophila* and changes in the function are indicative of the effect of said agent on the cardiac function of said *Drosophila*.
- 20 20. The method of claim 19 further including the step of electrically pacing the heart with electrodes and a pulse generator, so that parameters selected from the group consisting of the maximal heart rate and the frequency of occurrence of fibrillation-like rhythm are determined.
21. The method of claim 19 further including the step of increasing the temperature to stress the heart.
- 25 22. The method of claim 19 wherein the effect of said agent on age-related changes in the cardiac function is determined.
23. The method of claim 19, wherein the measurements are compared to a control set of data.
24. The method of claim 19, wherein said *Drosophila* is a *Drosophila melanogaster*.
- 30 25. The method of claim 19, wherein said *Drosophila* is anesthetized.
26. The method of claim 25, wherein the anesthesia is caused by triethylamine.

27. The method of claim 19, wherein said *Drosophila* is positioned under a microscope so that the light beam of said microscope is about perpendicular to the frontal plane of said *Drosophila* and is directed on the heart of said *Drosophila* and produces said image.
28. The method of claim 27, wherein contrast enhancement means are combined with said microscope to improve the image of the heart.
29. The method of claim 27 wherein said microscope is a fluorescence microscope and said *Drosophila* expresses a fluorescent protein in the heart.
30. The method of claim 29, wherein said fluorescent protein is green fluorescent protein,
31. The method of claim 19, wherein the movements of the walls of said heart are measured.
32. The method of claim 31 wherein said measure of the movements of said heart walls is heart rate.
33. The method of claim 19, wherein the measurements are compared to a control set of data.